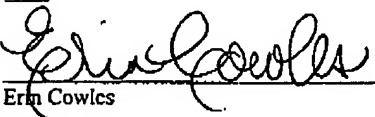



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PRE-APPEAL BRIEF REQUEST FOR REVIEW		Docket Number (Optional): P116D1-US	
I hereby certify that this correspondence is being facsimile transmitted to the USPTO at (571) 273-8300 or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on <u>March 15, 2006</u> .  Erin Cowles	Application Number: 10/651,821	Filed: August 29, 2003	
	First Named Inventor: Mathieu et al.		
	Art Unit: 3729	Examiner: Rick K. Chang	
<p>Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.</p> <p>This request is being filed with a notice of appeal.</p> <p>The review is requested for the reason(s) stated on the attached sheet(s). Note: No more than five (5) pages may be provided.*</p> <p>I am the</p> <p><input type="checkbox"/> applicant/inventor.</p> <p><input type="checkbox"/> assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)</p> <p><input checked="" type="checkbox"/> attorney or agent of record. Registration number: <u>39,923</u></p> <p><input checked="" type="checkbox"/> attorney or agent acting under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34: <u>39,923</u></p> <div style="text-align: right;"> Signature <u>N. Kenneth Burraston</u> Typed or printed name <u>(801) 323-5934</u> Telephone number <u>March 15, 2006</u> Date</div>			
<input checked="" type="checkbox"/> *Total of <u>5</u> page(s) of supporting argument are attached.			

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### **ARGUMENTS SUPPORTING PRE-APPEAL BRIEF REQUEST FOR REVIEW**

In support of Applicants' Pre-Appeal Brief Request For Review of the final rejection in the Office Action dated December 15, 2005 (hereinafter the "Office Action") in the above-identified patent application, Applicants respectfully submit the following:

#### **I. Background:**

Generally speaking, the claims at issue involve modifying a shape of an interconnection element by "transforming a property of one of the first element material and the second element material" that compose the interconnection element. Although the claims are not limited by the exemplary embodiments described in the specification—and Applicants are not advocating that the claims be limited to any of those embodiments—brief mention of an exemplary embodiment may be helpful in visualizing a non-limiting example. As shown in Figures 10 and 11, a property of at least one of a first element material 170 and second element material 180 can be changed, causing interconnection element 185 to change from the shape shown in Figure 10 to the shape shown in Figure 11.

#### **II. Argument:**

Although Applicants reserve the right to traverse the rejection of each pending claim, due to space limitations, in this pre appeal procedure, Applicants traverse independently the rejection of each of independent claims 19 and 38 and dependent claims 22 and 52-58.<sup>1</sup>

##### **A. Claim 19**

As discussed on pages 8 and 9 of the Amendment dated September 26, 2005, claim 19 recites that a free end of the interconnection element extends over masking material that is later removed.<sup>2</sup> Matunami's beam leads, which are shown in Figure 15 and 16 as comprising portions of a first metal film 18 and a second metal film 20 not removed in the transition from Figure 14 to Figure 15, are the only possible structures that the Examiner could have equated with the interconnection elements of claim 19, and the Examiner seems to have done so, while also equating portions of the first metal film 18 with the masking material of claim 19. Because

<sup>1</sup> In the Office Action, claims 19-27, 34, and 51-55 were rejected as anticipated by U.S. Patent No. 3,952,404 to Matunami ("Matunami"), and claims 38-42, 44-50, 55, 57, and 58 were rejected as anticipated by U.S. Patent No. 6,264,477 to Smith et al. ("Smith"). In addition, claims 28-30, 35-37, 43, and 56 were rejected as obvious in view of one or more of the following references: Matunami, Smith, and U.S. Patent No. 5,160,579 to Larson ("Larson").

<sup>2</sup> Claim 19 includes "creating an interconnection element having . . . a free end extending over a portion of [a] masking material," and claim 19 expressly recites "removing the masking material."

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claim 19 includes the step of "removing the masking material," however, only the portions of the first metal film 18 removed between Figure 14 and 15 could possibly be equated with the masking material of claim 19. As shown in Figures 15 and 16, however, no part of the beam leads (comprising the remaining portions of the first metal film 18 and the second metal film 20) ever extends over any portion of the first metal film 18 that is removed between Figures 14 and 15. Moreover, Matunami does not provide a suggestion or motivation to modify the beam leads shown in Figures 15 and 16 to extend over a portion of the first metal film 18 that is removed between Figures 14 and 15, nor would such a modification result in any advantage. Independent claim 19 as well as the claims that depend from claim 19 (claims 20-37 and 51-54) are therefore patentable over Matunami.

B. Claims 22 and 51-54

Claim 22 recites that the transforming step of claim 19 "produces a volume change in one of the first element material and the second element material." Matunami does not teach or suggest changing a volume of either the first metal film 18 or the second metal film 20 to bend the beam leads from the position shown in Figure 15 to the position shown in Figure 16. Indeed, merely bending a beam lead comprising two metal films—which is all Matunami teaches—does not teach, imply, or suggestion changing the volume of either of the films that compose the beam lead. Therefore, claim 22 is independently patentable over Matunami.

Claim 51 states that the transforming step recited in claim 19 "comprises applying a stimulus to the *interconnection element*." The Office Action equated Matunami's ultrasonic vibrations with the stimulus recited in claim 51. Matunami expressly teaches, however, that the ultrasonic vibrations "are applied to the wafer" 1—not to the beam leads shown in Figures 15 and 16. (Matunami col. 7, lines 18-20.) Moreover, Matunami does not suggest applying the ultrasonic vibrations to Matunami's beam leads, nor is there a reasonable expectation that applying the ultrasonic vibrations to the beams leads would cause the beam leads shown in Figure 15 to detach and bend into the positions shown in Figure 16. Therefore, claim 51 is independently patentable over Matunami.

Claim 52 states that "the first element material reacts differently to the stimulus than the second element material." The Office Action does not identify a—and, indeed, there is no—teaching or suggestion in Matunami that the first metal film 18 and the second metal film 20 (which were equated in the Office Action with the first element material and the second element

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material of claim 19) react differently to Matunami's ultrasonic vibrations (which was equated in the Office Action with the stimulus of claim 52). Claim 52 is therefore independently patentable over Matunami.

Claim 53 requires application of heat sufficient to trigger the transforming of a property that changes the shape of the interconnection element.<sup>3</sup> In rejecting claim 53, the Examiner stated that the ultrasonic vibrations applied to Matunami's wafer 1 necessarily generate heat. Nowhere, however, does Matunami teach or suggest, nor is it reasonable to suppose, that the ultrasonic vibrations applied to Matunami's wafer 1 generate sufficient heat to change the shape of Matunami's beam leads from what is shown in Figure 15 to what is shown in Figure 16. In fact, Matunami expressly teaches that the stimulus that triggers bending of Matunami's beam leads is the ultrasonic vibrations—not heat. (Matunami col. 7, lines 18-22.) Claim 53 is therefore independently patentable over Matunami.

Claim 54 states that a stimulus causes "the first material element to expand at a first rate and the second element material to expand at a second rate that is different than the first rate, which causes the modifying of the shape of the interconnection element." The Office Action does not identify a—and, indeed, there is no—teaching or suggestion in Matunami that Matunami's first metal film 18 expands differently than the second metal film 20 in response to the ultrasonic vibrations applied to wafer 1. (See Matunami col. 7, lines 18-22.) Claim 54 is therefore independently patentable over Matunami.

C. Claim 38

As discussed on pages 9 and 10 of the Amendment dated September 26, 2005, claim 38 includes an "interconnection element" that comprises "a first element material and a second element material." That the interconnection element comprises at least two different materials is important because, as further stated in claim 38, the interconnection element is bent by "transforming a property of one of the first element material and the second element material." Nowhere does Smith teach bending an interconnection element that comprises two element materials. Rather, as shown in Figure 12, the spring contact 15 bent by Smith comprises

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<sup>3</sup> Claim 53 states that the "stimulus [applied to the interconnection element] comprises heat," and claim 51 (claim 53 depends from claim 51) states that "the stimulus triggers the transforming of the property," which claim 19 states modifies "the shape of the interconnection element."

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only one material. (See generally Smith Figures 10-13 and col. 6, line 45 through col. 9, line 10.)

In the Office Action, the Examiner cites Smith column 4, lines 45-61 to support his position that Smith teaches bending a spring contact that comprises at least a first element material and a second element material. Presumably the Examiner is relying on Smith's statement that, if the spring contact 15 is made of a non-conductive or semiconductive material, the spring contact 15 is coated with a conductive material.<sup>4</sup> (Smith col. 4, lines 59-61.) As shown in Figure 12, however, it is the spring contact 15—not a spring contact 15 and a coating—that is bent. Indeed, Figure 13 illustrates application of a conductive coating 19 to the spring contact 15 *after* the spring contact is bent into the position shown in Figure 12. Therefore, Smith's teachings that spring contact 15 can be coated with a conductive coating (e.g., gold coating 19 in Figure 13) does not meet the requirements of claim 38, which requires bending an interconnection element that comprises at least two "material element[s]." Clearly, as shown in Figure 12, Smith's contact structure 15 comprises no more than one material element while being bent into the position shown in Figure 12. Independent claim 38 as well as the claims that depend from claim 38 (claims 39-50 and 55-58) are therefore patentable over Smith.

D. Claims 55-58

Claim 55 states that the transforming step of claim 38 "comprises applying a stimulus *to the interconnection element*." In the Office Action, etching Smith's insulating under layer 13 was equated with the stimulus of claim 55. Etching in Smith, however, is not applied to the spring contact 15 (which was equated with the interconnection element of claim 38) but to the insulating under layer 13. Claim 55 is therefore independently patentable over Smith.

Claim 56 states that "the first element material reacts differently to the stimulus than the second element material, which causes the modifying of the shape of the interconnection element." Nowhere does Smith or Matunami teach or suggest such a feature. Claim 56 is therefore independently patentable over Smith and Matunami.

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<sup>4</sup> Smith also states that the spring contact 15 can comprise a metal alloy, such as nickel-zirconium. By definition, however, an alloy is "A homogeneous mixture or solid solution of two or more metals, the atoms of one replacing or occupying interstitial positions between the atoms of the other: *Brass is an alloy of zinc and copper.*" (See Online dictionary "Dictionary.com.") A homogeneous mixture of metals does not constitute "a first material element" and "a second material element" as required by claim 38. Rather, a homogeneous mixture of metals must be considered one material element. For example, an object formed only of brass cannot be deemed to have both a first material element and a second material element.

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Claim 57 states that the stimulus applied to the interconnect element comprises heat. In rejecting claim 57,<sup>5</sup> the Examiner acknowledged that Smith does not disclose heat as a stimulus to be applied to the spring contact 15. To make up for this deficiency in Smith, the Examiner proposes replacing the step of etching the insulating under layer 13 with the step of applying ultrasonic vibrations, as disclosed in Matunami, to substrate 14 to release the free portion 11 of the spring contact 15.

The combination of Smith and Matunami, however, fails to render claim 57 obvious for at least two reasons. First, claim 57 requires applying heat—not ultrasonic vibrations—as a stimulus. Thus, even if the combination is made as proposed by the Examiner, the combination does not apply heat as a stimulus and therefore does not meet the requirements of claim 57. Second, nothing in Smith implies problems with or drawbacks with freeing the free portion 11 of the spring contact 15 by etching the insulating under layer 13. Similarly, nothing in Matunami teaches or suggests that applying ultrasonic vibrations provides any advantage or improvement over etching. Moreover, there is no indication that applying ultrasonic vibrations to Smith's substrate 14 would free the free portion 11 of the spring contact 15. Thus, not only is there no motivation to replace Smith's etching step with Matunami's ultrasonic vibrating step, there is not a reasonable expectation of success for such a replacement. Claim 57 is therefore independently patentable over Smith and Matunami.

Claim 58 states that a stimulus applied to the interconnection element "causes the first element material to expand at a first rate and the second element material to expand at a second rate that is different than the first rate, which causes the modifying of the shape of the interconnect element." Nothing in Smith teaches or suggests such features. Indeed, the Office Action does not identify any portion of Smith as teaching or suggesting such features. Claim 58 is thus independently patentable over Smith.

### **III. Conclusion:**

In view of the foregoing, Applicants respectfully submit that independent claims 19 and 38 are patentable over the prior art of record and at least dependent claims 22 and 51-58 are independently patentable over the prior art of record.

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<sup>5</sup> In the Office Action, claim 56 was rejected as obvious in view of Smith and Matunami, and claim 57 as rejected as anticipated by Smith. It would appear, however, that the Examiner intended to reject claim 56 as anticipated by Smith and claim 57 as obvious in view of Smith and Matunami.